

CLAIMS

1. An automotive trim panel, comprising a pliable cover layer having a front surface and a rear surface, the cover layer comprising a plurality of openings extending from the front surface to the rear surface, and a light source to light through the openings from the rear surface to the front surface.

2. The automotive trim panel of claim 1, wherein said pliable material has an elongation over 150%.

3. The automotive trim panel of claim 1, wherein said pliable material has a tensile strength below 5000 psi.

4. The automotive trim panel of claim 1, wherein said pliable material has a Shore Hardness between 60-100A.

5. The automotive trim panel of claim 1, wherein said pliable material is selected from the group consisting of leather, polyvinyl chloride, polyurethane, and cloth.

6. The automotive trim panel of claim 1, further comprising a coating on the plurality of openings extending from the front surface to the rear surface.

7. The automotive trim panel of claim 1, wherein the openings are formed in a shape

1 selected from the group consisting of circles, squares, ovals, hexagons, pentagons, rectangles,
2 stars, or mixture thereof.

3
4 8. The automotive trim panel of claim 1, wherein said opening is a circle shape of
5 diameter 0.010 - 0.060".

6
7 9. The automotive trim panel of claim 5, wherein the coating is light transmissive.

8
9 10. The automotive trim panel of claim 9, wherein the coating is transparent.

10
11 11. The automotive trim panel of claim 1, wherein the light source is a light emitting
12 diode.

13
14 12. The automotive trim panel of claim 1, further comprising a retainer panel and a
15 housing for securing the light source to the retainer panel.

16
17 13. The automotive trim panel of claim 12, wherein the housing comprises
18 conductive traces to couple the light source to vehicle wiring.

19
20 14. The automotive trim panel of claim 12, further comprising an actuator and a
switch, the actuator spaced from the rear surface of the cover layer, the actuator causing the
switch to change state when a force is applied to the cover layer.

1
2 15. The automotive trim panel of claim 14, wherein the actuator has a plurality
3 openings to allow light to travel from the light source through the actuator and through the
4 openings in the cover layer.

5
6 16. An automotive trim panel, comprising:
7 a light transmissive pliable cover layer having a first side and a second side,
8 a light blocking layer covering at least a portion of the transmissive layer,
9 a light source located on the first side of the light transmissive layer, the light blocking
10 layer allowing light to travel from the light source through the transmissive layer to the second
11 side only where the light blocking layer is not present.

12
13 17. The automotive trim panel of claim 16, wherein said pliable material has an
14 elongation over 150%.

15
16 18. The automotive trim panel of claim 16, wherein said pliable material has a tensile
17 strength below 5000 psi.

18
19 19. The automotive trim panel of claim 16, wherein said pliable material has a Shore
20 Hardness between 60-100A.

21
22 20. The automotive trim panel of claim 16, further comprising a foam layer.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

21. The automotive trim panel of claim 16, wherein the foam layer includes a void aligned with the light source and the void is filled with a light transmissive material.

22. The automotive trim panel of claim 16, further comprising a retainer layer.

23. The automotive trim panel of claim 16, wherein the light transmissive layer is transparent.

24. The automotive trim panel of claim 16, wherein the light blocking layer is coupled to the first side of the cover layer.

25. The automotive trim panel of claim 16, wherein the light blocking layer is coupled to the second side of the cover layer

26. The automotive trim panel of claim 16, wherein the light source is a light emitting diode.

27. The automotive trim panel of claim 16, wherein the light blocking layer is a painted coating.

28. The automotive trim panel of claim 16, wherein the trim panel is an automotive

HAYES, SOLOWAY,
ENNESSEY, GROSSMAN
& HAGE, P.C.
175 CANAL STREET
MANCHESTER, NH
03101-2335 U.S.A.

603-668-1400

1 instrument panel

2

3 29. An automotive trim panel, comprising:
4 a light transmissive cover layer having a front surface and rear surface,
5 a light pipe having a first end and a second end, and a light source, wherein said first end
6 of said light pipe is positioned adjacent to said rear surface of the cover layer and said second
7 end is positioned adjacent said light source.

8

9 30. The automotive trim panel of claim 29, including a foam layer, wherein the light
10 pipe is molded in the foam layer.

11

12 31. The automotive trim panel of claim 30, wherein the light pipe is inserted in an
13 opening formed in the foam layer by a laser.

14

15 32. The automotive trim panel of claim 29, wherein the cover layer is light
16 transmissive.

17

18 33. The automotive trim panel of claim 29, wherein the cover layer is transparent.

19

20 34. The automotive trim panel of claim 29, wherein the light pipe is made of an
21 acrylic polymer material.

22

1 35. The automotive trim panel of claim 29, wherein the light pipe is a fiber optic.

2

3 36. The automotive trim panel of claim 29, wherein the light source is a light emitting
4 diode.

5

6 37. The automotive trim panel of claim 29, further comprising a plurality of light
7 pipes.

8

9 38. The automotive trim panel of claim 29, further comprising a colored filter in
10 series with the light source to change the color of the exiting light.

11

12 39. A method of back lighting an automotive trim panel, comprising:
13 forming a plurality of openings in a pliable cover layer of the trim panel,
14 positioning a light source relative to the openings to allow light to exit through the
15 openings and enter the vehicle compartment.

16

17 40. The method of claim 39, wherein said pliable material has an elongation over
18 150%.

19

20 41. The method of claim 39, wherein said pliable material has a tensile strength
21 below 5000 psi.

22
HAYES, SOLOWAY,
ENNESSEY, GROSSMAN
& HAGE, P.C.
175 CANAL STREET
MANCHESTER, NH
03101-2335 U.S.A.

603-668-1400

1 42. The method of claim 39, wherein said pliable material has a Shore Hardness
2 between 60-100A.

3
4 43. The method of claim 39, further comprising the step of coating the plurality of
5 openings with a light transmissive material.

6
7 44. The method of claim 39, wherein the openings are formed in a shape selected
8 from the group consisting of circles, squares, ovals, triangles, hexagons, pentagons, rectangles,
9 stars, or mixtures thereof.

10
11 45. The method of claim 44, wherein the diameter of the circle is in the range of .010-
12 .060"

13
14 46. The method of claim 39, wherein the openings formed are at an angle to a front
15 surface of the cover layer.

16
17 47. The method of claim 39, wherein the openings formed are perpendicular to a front
18 surface of the cover layer.

19
20 48. The method of claim 39, wherein the openings formed have a uniform cross
21 sectional area.

HAYES, SOLOWAY,
ENNESSEY, GROSSMAN
& HAGE, P.C.
175 CANAL STREET
MANCHESTER, NH
03101-2335 U.S.A.

603-668-1400

1

49. The method of claim 39, wherein the openings are formed with a laser.

2

HAYES, SOLOWAY,
HENNESSEY, GROSSMAN
& HAGE, P.C.
175 CANAL STREET
MANCHESTER, NH
03101-2335 U.S.A.

603-668-1400